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"SOIL CONSERVATION RESEARCH"

Broadcast No. 10 in a series
of discussions of soil con-
servation in the Ohio Valley.

WLW, Cincinnati

July 2, 1938 6 - 6:15 p.m.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Dayton, Ohio



SOUND: Thunder, followed by rain...

ANNOUNCER

Fortunes Washed Away!

MUSIC: Fading...

ANNOUNCER

One bright summer's day in England nearly a hundred years ago, two men of science stood near the center of a broad grassy field, just a few miles northwest of London. They gazed at the land with eager eyes...

MUSIC: Fading...

LAWES

This is it, Gilbert! At last we've found the ideal spot for our experiments.

GILBERT

Yes, the soil looks sweet and rich.

LAWES

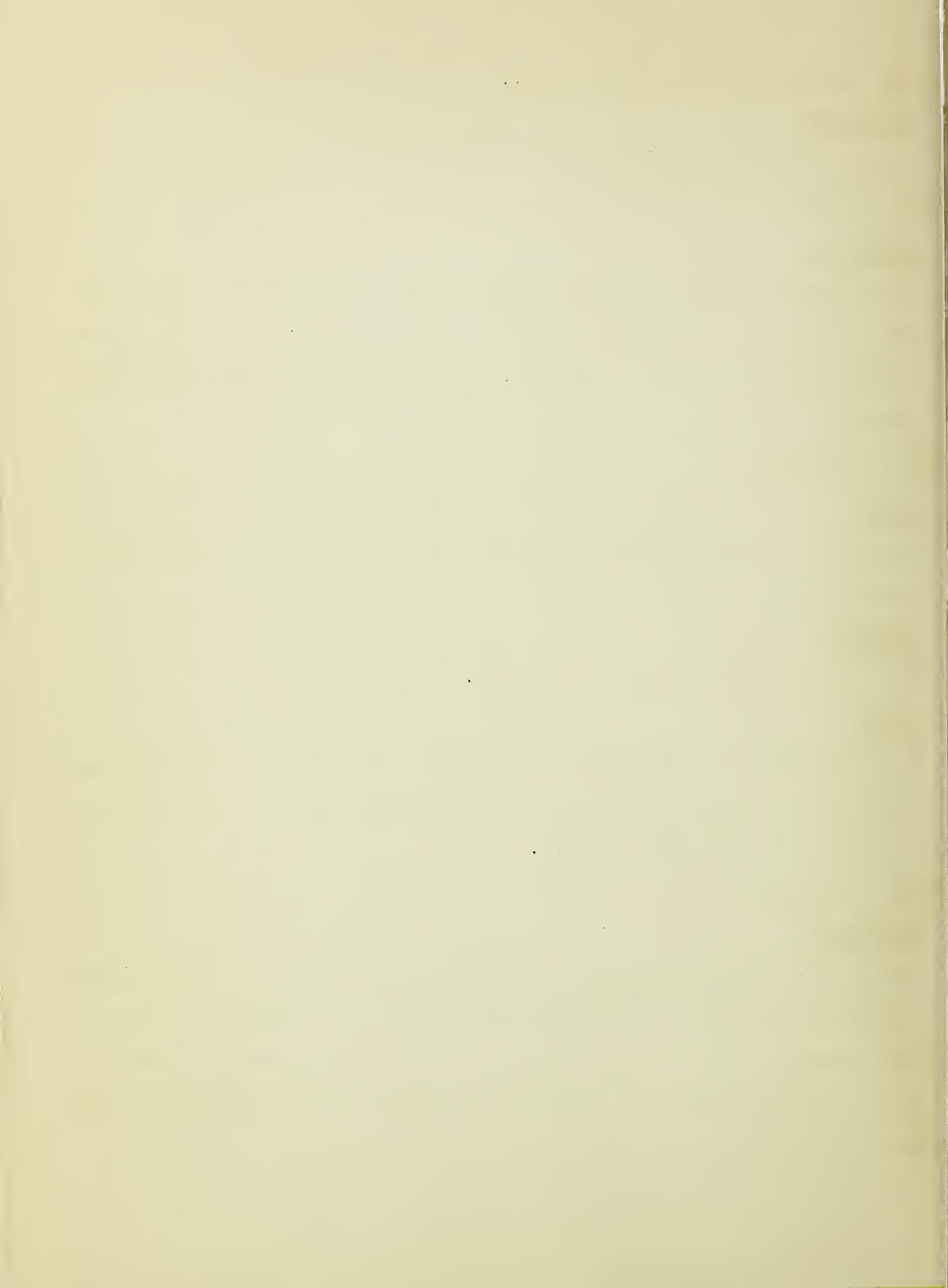
We must study its chemical composition. We must learn how growing crops are nourished from the ground and what compounds are needed to keep the soil productive...

MUSIC: Fading...

ANNOUNCER

Thus, at Rothamsted, England, in 1843, J. B. Lawes and J. H. Gilbert started a series of field experiments that were destined to change the course of agricultural history--a series of experiments that led to the discovery of commercial fertilizer as we know it today.

MUSIC: Up briefly, then fading...



ANNOUNCER

The Rothamsted experiments have continued unbroken for almost a century. Meanwhile agricultural research--the application of science to the everyday problems of farming--has spread to practically every civilized nation on earth. In the United States a system of state agricultural experiment stations was established by the Hatch Act of 1887. But only in comparatively recent years has agricultural science in the United States focussed on one of America's most critical farming problems--the problem of soil erosion. On a rainy spring morning in 1916, two soils experts of the Missouri Agricultural Experiment Station stood at the window of their small office watching the downpour...

SOUND: Heavy rain continuing through following dialogue...

MILLER

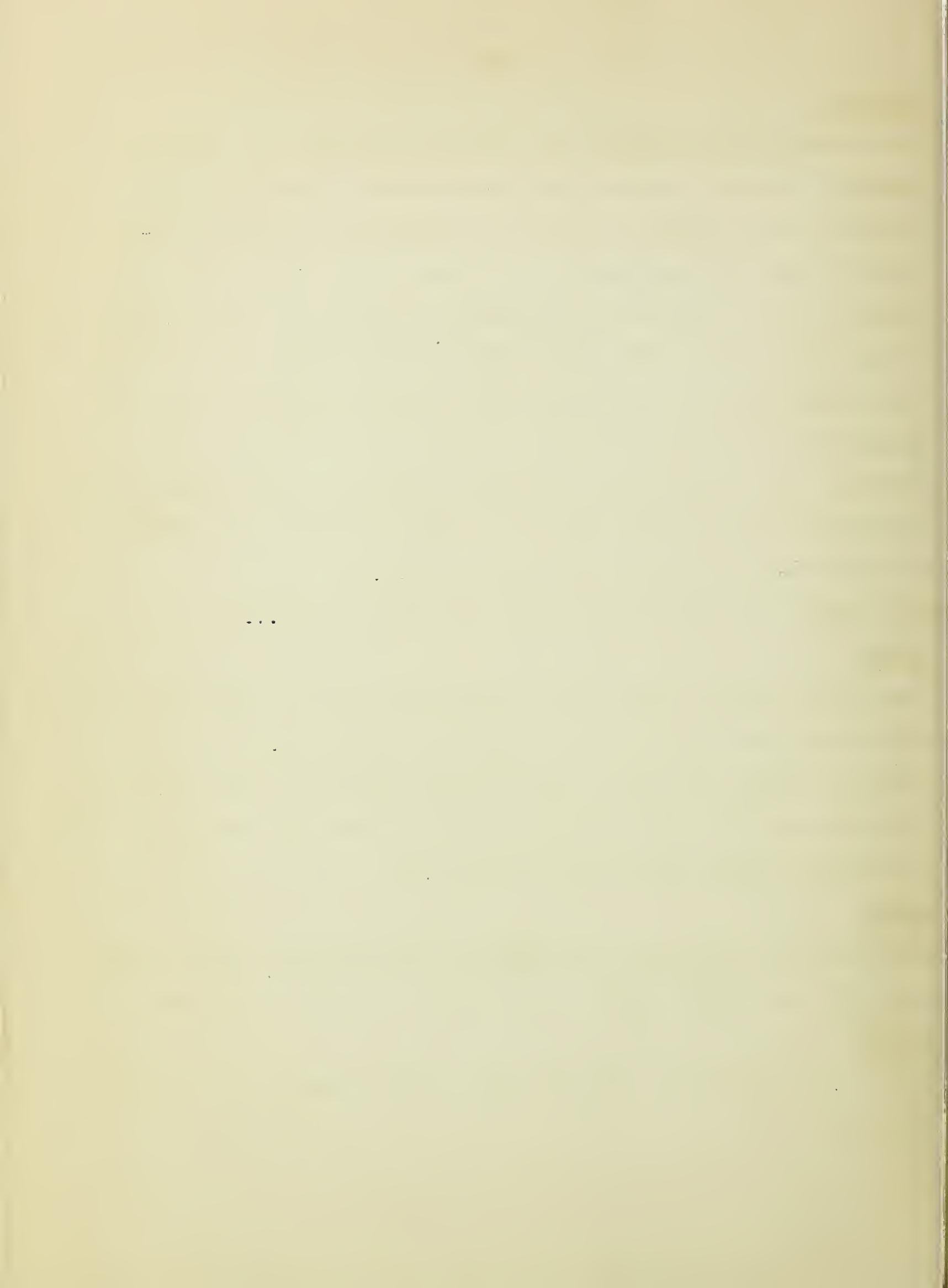
Look at the color of the water pouring off that bare hillside! I don't even dare think how much soil is going to waste. (pause) You know, Duley, I've been watching this thing for a long time. But right now I'm more convinced than ever that soil erosion is the biggest enemy the American farmer has.

DULEY

Every time it rains like this, Miller, I'm inclined to agree with you. But who knows? Maybe erosion isn't as bad as we think.

MILLER

Maybe not. But why not stop all this speculating? Let's find out for sure.



DULEY

I'd certainly like to--but how?

MILLER

You know those experiments that were conducted on the Manti National Forest in Utah?

DULEY

Yes. On open range land under conditions of natural vegetation. What's that got to do with...

MILLER (Cutting in)

Wait a minute. Why can't we measure soil and water losses from cultivated land right here on the experiment station grounds...

MUSIC: Fading...

ANNOUNCER

These two men, M. F. Miller and F. L. Duley, published their results in 1923. They were pioneers in the field of erosion investigations. Through the 1920's experiments along lines they laid down were conducted by other State and Federal agencies. Slowly and gradually, a background of erosion information was built up. Finally, in 1928, a most significant amendment to the Department of Agriculture Appropriation Bill was offered by Representative Buchanan of Texas...

SOUND: Loud hum of voices, gradually subsiding as Buchanan addresses the chair and gavel pounds for order...

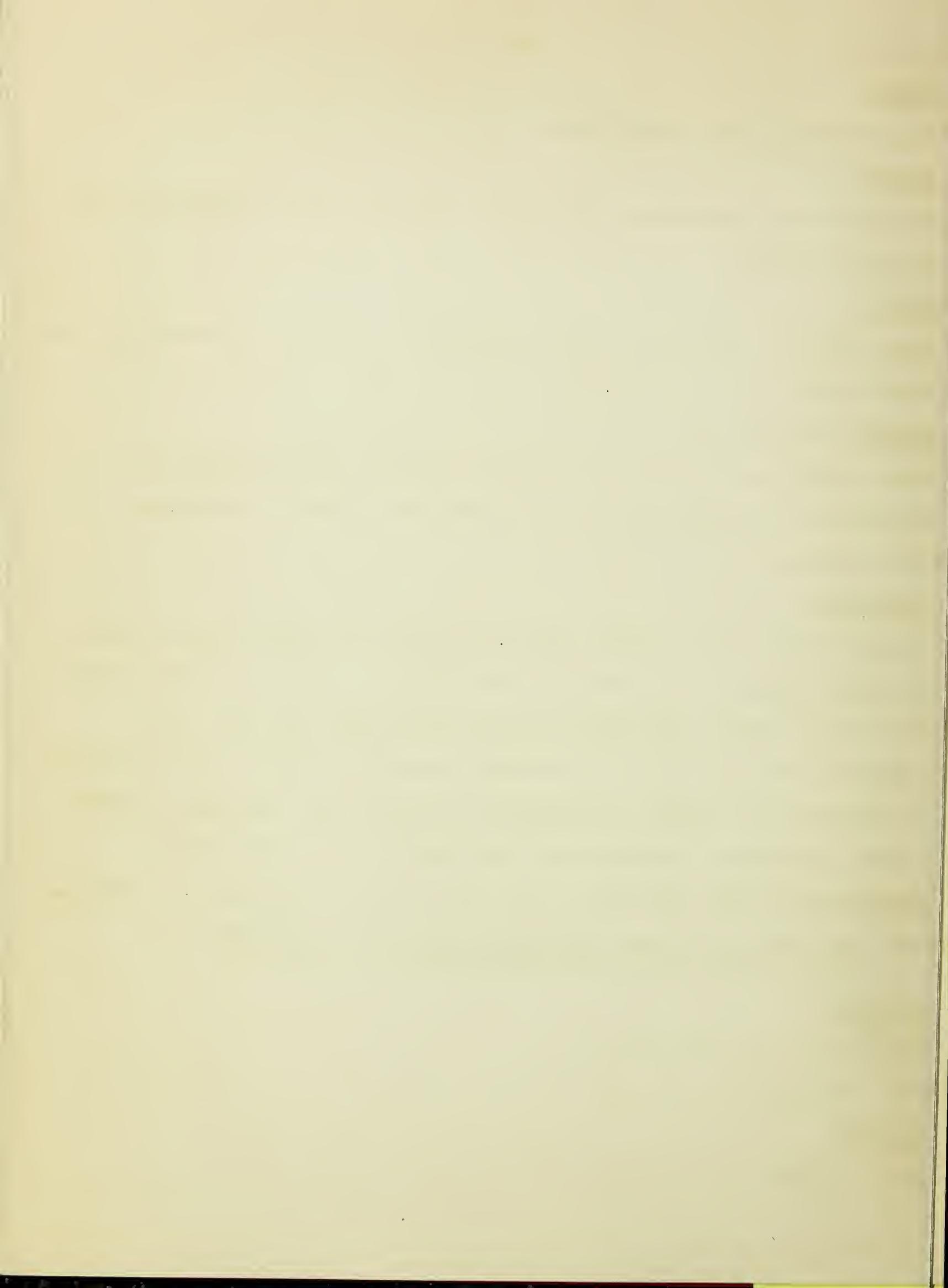
BUCHANAN

Mr. Speaker, Mr. Speaker.

SOUND: Rapping for order...

SPEAKER

The gentleman from Texas.



BUCHANAN

I wish to offer an amendment to this bill as read. On page 49, line 14, I propose the following paragraph be inserted: "To enable the Secretary of Agriculture to make investigations...of the causes of soil erosion and the possibility of increasing the absorption of rainfall by the soil in the United States... (fading)

MUSIC: Fading...

ANNOUNCER

Under authority of the Buchanan amendment, the Department of Agriculture, starting in 1929, established 10 soil erosion experiment stations. Each was located in a typical farming region. In the Piedmont section of the Southeast, a station was set up at Statesville, North Carolina with J. M. Snyder as director. Shortly after his appointment, Mr. Snyder went over the experiment station grounds with his associates and pointed out the need for precise information...

SOUND: Purr of motor through following speech...

SNYDER

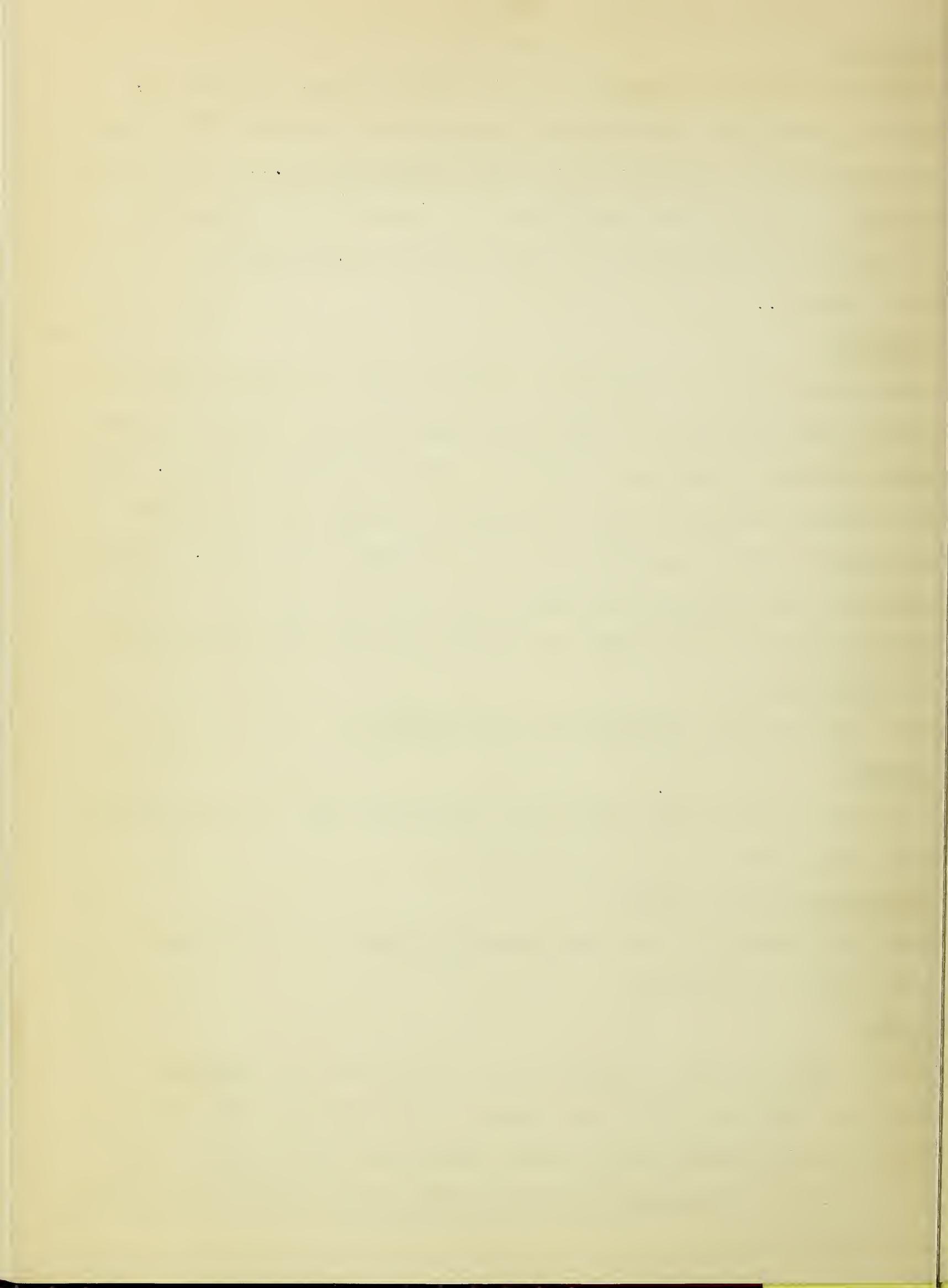
As I see it, there are really four factors in this erosion problem: soil type, slope, climate, and land use.

EXPERIMENT STATION WORKER

Well, Mr. Snyder, I don't see how we're going to do much about soil, slope, or climate.

SNYDER

That's just the point, Lester. Those first three are natural factors. They lie pretty much beyond human control. But that fourth factor, land use, is mighty important. We've got to find out what kind of farming practice speeds up soil wash and what kind holds it in check.



EXPERIMENT STATION WORKER

Sounds like a good idea. But how are we going to get this information?

SNYDER

I was coming to that.

SOUND: Grind of brakes, car coming to stop...

SNYDER

On this hillside here, we'll set out a series of plots. Naturally, they'll all have the same conditions of soil, slope, and climate.

EXPERIMENT STATION WORKER

In other words, we'll eliminate those three factors the farmer can't control.

SNYDER

That's it exactly. But we'll treat each plot in a different way. For example, over there on the left we might have a plot just lying fallow all the time. Then we'll have another one planted to cotton year after year. A third one might be in rotation and a fourth in permanent grass...

MUSIC: Fading...

ANNOUNCER

At the foot of each plot J. M. Snyder placed a big vat to catch and hold all soil and water that ran off the plot surfaces. Month after month, he carefully measured the mounting piles of silt. In 1936, after five years of close investigation, Snyder reported some of his findings to a small group of technical workers...

SOUND: Hum of voices, moving about of chairs...



SNYDER

Now, gentlemen, I'm just going to run through some of our findings here at Statesville and let you draw your own conclusions. As you know, we've been measuring soil and water losses over the past five years from six different plots lying side by side on a 10 percent slope. The soil is Cecil sandy clay loam...

TECHNICIAN (breaking in)

Why, I've seen a number of fields like that just in the past week.

SNYDER

Yes, it's reasonably typical of actual farming conditions all through the southern Piedmont region. Now, here's what we found. The plot left in fallow through all these years shows the heaviest runoff and erosion damage by a wide margin. Nearly 30 percent of all the rainfall has run away--entirely wasted. Soil losses have amounted to more than $6\frac{1}{4}$ tons per acre every year. If the present rate of erosion continues, the most productive layer of soil--the top seven inches--is going to last only about 13 more years!

SOUND: Murmurs of surprise, etc.

SNYDER

Now, the plot in cotton all the time has a slightly better record. It shows an average runoff of a little more than 10 percent and an annual soil loss of nearly 23 tons per acre. The upper seven inches of soil are good for about 39 more years.

TECHNICIAN (Almost indignantly)

You don't mean to say that cotton will stop soil washing. Why, I've seen cotton fields...

SOUND: Other voices joining in...



SNYDER (Cutting them off)

No, you're getting the wrong idea. This experiment simply proves that even a thin cover like cotton is better than no cover at all. Actually, you'll notice, the soil losses are still heavy enough to worry about. However, when cotton is planted only every fourth year in rotation with corn, wheat, and lespedeza....

TECHNICIAN

Yes, what happens then?

SNYDER

Why, then the soil loss is more than cut in half. It amounts to less than 11 tons per acre every year. Under a rotation like that, it's going to take 109 years to wash away those seven inches of topsoil. But here's the startling fact. Under a good permanent cover of grass, the top soil layer is lashed down for 96,000 years and under virgin forest for at least half a million years....

MUSIC: Fading...

ANNOUNCER

Experiments at other soil erosion stations over the nation have shown the same general trend. Taken together, these results lead almost inevitably to one conclusion: soil and water loss is closely associated with the type of vegetative cover and with the amount of time it remains on the land. But as soil conservation work has expanded, the need for scientific information has also widened. At present, soil conservation research attacks almost every phase of the soil erosion problem. And now let's turn to the Soil Conservation Service itself--specifically to Ewing Jones of the Dayton, Ohio, office. Ewing, suppose we start off with a word or two about the present scope of soil conservation research, about the kind of studies you're making at the present time?



JONES

Well, _____, you just about summed it up when you said we were getting at the erosion problem from practically every angle. Research workers of the Service are charting the behavior of rainstorms over a large area in the Muskingum Conservancy District. They're also studying the natural circulation of waters. They're measuring deposits of silt along stream channels and in reservoirs all over the country. They're searching for new and improved strains of erosion-resistant plants with high economic value. And they're getting at the dollars-and-cents end of the whole problem through farm management studies.

ANNOUNCER

Well, let me say that I, for one, can't think of any other angles. Now, how about the progress that's been made to date? How far have you moved toward your appointed goal?

JONES

In the first place, _____, I'm not sure that we have any definite appointed goal. Investigating the erosion problem is something like traveling in a ship at sea. As you move forward, the horizon is constantly receding into the distance.

ANNOUNCER

In other words, you figure there'll always be something more to learn about soil conservation.

JONES

Yes, but don't misunderstand me. I don't mean to imply that we're chasing a will-of-the-wisp, or that we haven't made any progress to date. As a matter of fact, a great many new avenues of investigation have been opened up just in the last year or so. And we can now speak with certainty on a great many questions that used to cause confusion and doubt.



ANNOUNCER

Fair enough. Just one more question and then I'm through. Ewing, I know the Soil Conservation Service is carrying on a research program and a program of actual demonstration on farm lands. But I'm not entirely clear how the two programs tie in together. Can you help me out there?

JONES

To answer that one, let's call in a man who's had some actual experience with this kind of work. He's John D. Riley, superintendent of the erosion control CCC camp at Elizabethtown, Kentucky. How about it, John?

RILEY

Well, Ewing, some of the details of soil conservation have to be worked out right on the piece of land that requires treatment. But we certainly couldn't go very far without a research program to point the way.

JONES

All right, let's get down to cases. Just how have you made use of research findings in your own work area?

RILEY

For one thing, we're doing quite a lot of terracing. Terraces have to be pretty carefully built if they're going to do an efficient job.

JONES

You mean they have to be spaced close enough together so that very little erosion takes place between one structure and the next?



RILEY

Yes. And terrace channels have to be graded so as to carry water across the slope at non-erosive speed. The ridges have to be built to handle the heaviest rain that can be expected over a period of years. Now, all these details have been carefully worked out by various experiments. As a result, we can go ahead and build our terraces with confidence that they'll really meet the situation.

JONES

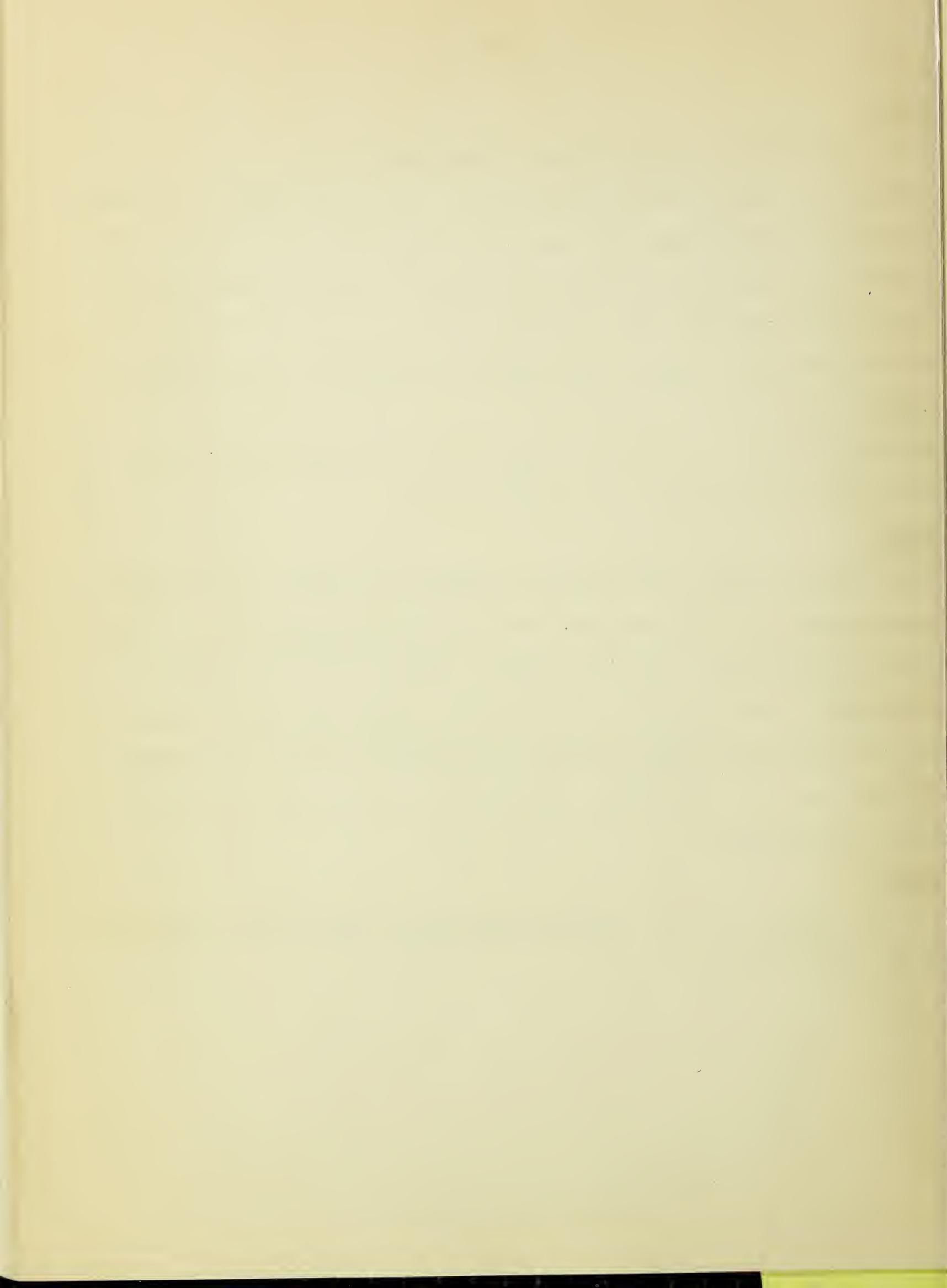
Speaking of terraces, John, brings up the old question of using standard farm machinery on terraced fields.

RILEY

Well, as you know, the Service is conducting studies all through the Corn Belt to find out how ordinary farm equipment fits in with a soil conservation plan of farming. Those studies have shown that most of the machines owned by the average Corn Belt farmer can be used without much trouble. Sometimes a little adjustment is required here and there. But there's never a need to throw away any equipment.

JONES

You say adjustments are sometimes necessary. What kind of adjustments, for example?



RILEY

Well, take the ordinary grain binder. When a farmer's using it in a terraced field, he generally shortens the hitch just a little by changing the point of attachment. This has a sort of telescoping effect that permits the binder to cross terraces without any danger of being stranded on top of the ridges. Then, when a farmer pulls his grain binder alongside a terrace, he can avoid damage to both terrace and binder by raising the front end of his cutter bar a few inches above its ordinary position. There are a number of other adjustments that can be made. But I think this will illustrate the point.

JONES

Very nicely. And thanks, John, for helping me out. I was afraid _____ was going to ask a question back
(announcer's name) there that I might not be able to answer.

ANNOUNCER

As a matter of fact, Ewing, I do have just one more question.

JONES

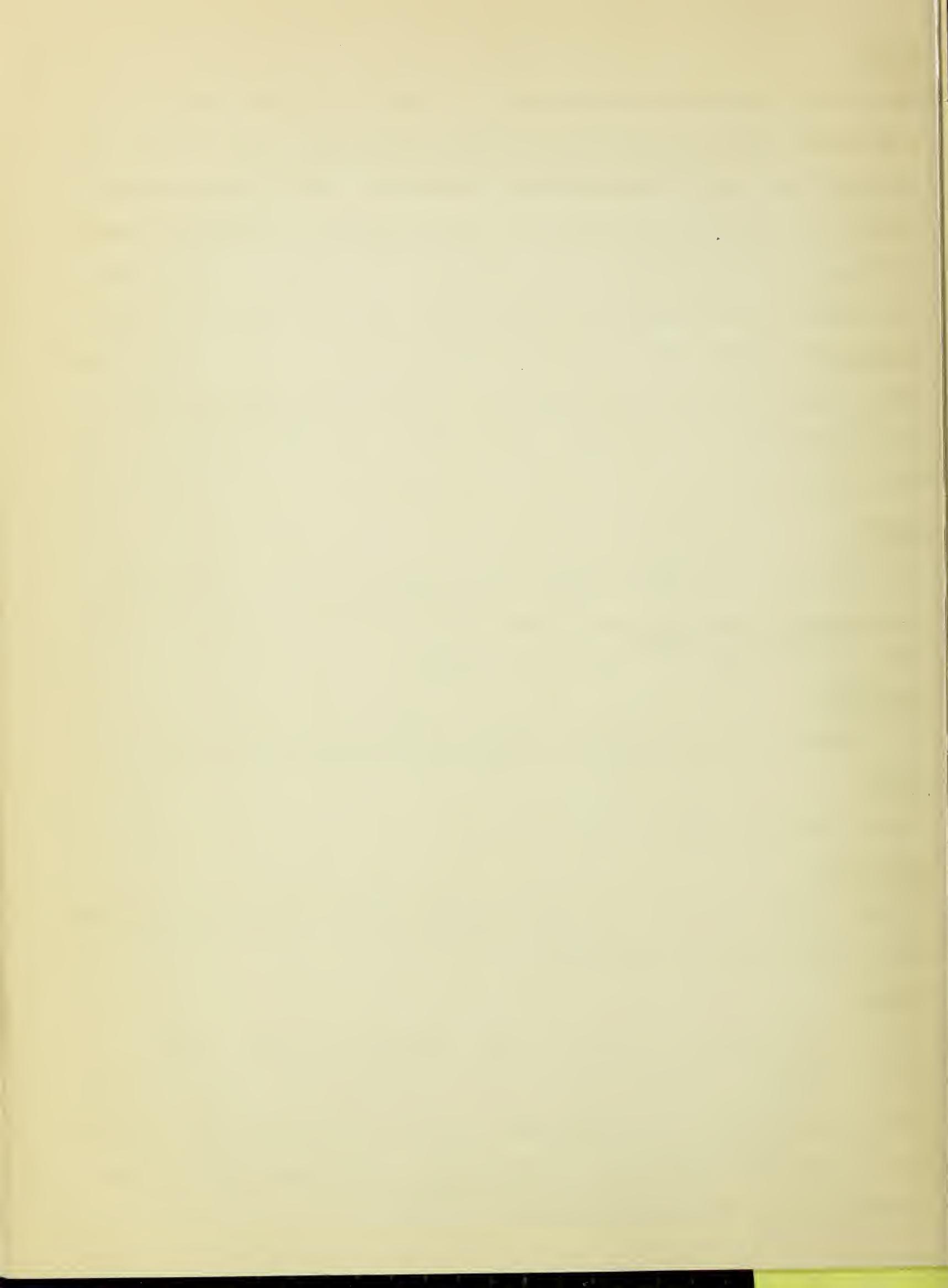
I was afraid of that.

ANNOUNCER

No need to be. It's really quite simple. What are you recommending today in the line of bulletins?

JONES

Let's offer "Working Together in the Muskingum Valley." This bulletin gives a complete picture of the many-sided program that's being carried out in the Muskingum Conservancy District by Federal, State, and local agencies. Incidentally, every type of soil conservation research is represented.



SOUND: Thunder, followed by rain...

ANNOUNCER

If you would like a copy of "Working Together in the Muskingum Valley," just write to Soil Conservation, Dayton, Ohio. Next week, saving soil with sod...

SOUND: Up on thunder and rain...

ANNOUNCER

This is an educational presentation of the Nation's Station.

